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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,098	12/21/2005	Takashi Ito	9369-114US (T37-196236C)	8148
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EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1722				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@panitchlaw.com

Office Action Summary

Application No.

10/562,098

Applicant(s)

ITO ET AL.

Examiner

ANCA EOOF

Art Unit

1722

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7, 8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7, 8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1, 7, 8 and 10 are pending in the application. Claims 2-6 and 9 have been cancelled.
2. The certified English translation of the foreign priority document JP 2003-180470, filed on June 25, 2003 was received and acknowledged.

The examiner apologizes for the error made in the previous Office Action wherein the limitation "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" was considered an intended use.

The current Office Action is made non-final.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1, 7, 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a resin composition comprising a cationic-polymerizable organic compound, a radical-polymerizable organic compound, a photo initiator for cationic polymerization and an ultraviolet light-sensitive photoinitiator for radical polymerization, wherein the photo initiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent.

It is not clear what the applicant means by "the photo initiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent", when all the components are mixed/combined to form the claimed resin composition.

The photo initiator for cationic polymerization is dissolved or dispersed in a solvent before it is mixed with the other components to form the resin composition (see paragraph (2) on page 29 (Example 1) and paragraph (2) on pages 31-32 (Example 2) of the specification of the instant application).

When all the components are mixed to form the resin, they all dissolve (see paragraph (3) on page 29 (Example 1) and paragraph (3) on page 32 (Example 2) of the specification of the instant application).

Therefore, when all the components are mixed to form a resin, it is not possible to have the photo initiator for cationic polymerization as the only component in the composition dissolved or dispersed in a solvent.

It is not clear what is the applicant claiming by the limitation "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent".

In view of the Examples 1 and 2 of the specification, this limitation is interpreted as "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent before it is mixed with the other components to form the resin composition".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158).

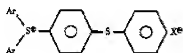
With regard to claims 1 and 10, Ohkuma et al. disclose a photosensitive composition containing a radical-polymerizable monomer, a cationic-polymerizable monomer, a radical polymerization initiator and a cationic-polymerization initiator (abstract).

The radical-polymerizable monomer may be a monomer with (meth)acrylate groups (column 3, lines 17-48).

The cationic-polymerizable monomer may be a monomer with epoxy groups (see examples in columns 5-6).

The radical-polymerization initiator may be a compound exhibiting effective light absorption in UV region (column 8, lines 58-60).

The cationic-polymerization initiator may be represented by the formula (I):



(I) (column 10, lines 1-10), wherein Ar is an aryl group and X^- may be SbF_6^- (column 10, lines 23-24).

The specific examples in the specification show cationic-polymerization initiators wherein Ar is a phenyl group (see Examples 1-3 and 5-8 in columns 12-15).

The compound (I) having as Ar a phenyl group and as X^- a SbF_6^- anion is equivalent to the compound of formula (I) of the instant application.

Okhuma et al. do not specifically teach the compound of formula (I) of the instant application. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain it, based on the teachings of Okhuma et al. regarding the compound (I) above, the examples of anions X^- and the examples wherein Ar is a phenyl group.

However, Okhuma et al. do not teach the purity of the cationic-polymerization initiator of formula (I), as required by the instant application.

Date et al. disclose a method of manufacturing sulfonium salts used as photocationic polymerization initiators for resists (par.0045).

In Example 5, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% (par.0063-0065). It is not explicitly specified that (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is synthesized in Example 5 but the ingredients are the same as for Example 2 which leads to (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate except that potassium hexafluoroantimonate replaces potassium hexafluorophosphate. Date et al. further disclose that ^{13}C -NMR analysis and IR analysis indicated that the (4-

phenylthiophenyl) diphenylsulfonium hexafluoroantimonate comprises small amount of raw materials diphenyl sulfoxide, diphenyl sulfide(par.0052-0053 and par.0063-0064).

It is the examiner's position that there is no compound represented by formula (II) of the instant application in the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate of Example 5 of Date et al. Therefore the limitations of claims 1 and 10 for the quantity of compound of formula (II) are met.

It would have been obvious for one of ordinary skill in the art to use the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% obtained in the process of Date et al. as photocationic polymerization initiators in the composition of Ohkuma et al., since Date et al. specifically indicate this use for the high-purity sulfonium salts (Date et al., par.0045 and par.0062).

The limitation of claim 1 "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" is interpreted as "the state or the property of the photoinitiator for cationic polymerization before it is mixed to the other components to form the resin composition".

This interpretation is in accordance to the teachings in paragraph (2) on page 29 (Example 1) and paragraph (2) on pages 31-32 (Example 2) of the specification of the instant application.

In order to form the claimed composition, a solution/dispersion of photoinitiator for cationic polymerization in a solvent is mixed with the other components. The resin composition comprises all the claimed components and a solvent (see paragraph (3) on

page 29 (Example 1) and paragraph (3) on page 32 (Example 2) of the specification of the instant application).

Ohkuma et al. also teach that the composition comprises a solvent which dissolves or disperses the components of the composition (column 11, lines 7-8).

Therefore, the composition of Ohkuma modified by Date is equivalent to the resin composition of claim 1 of the instant application.

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

With regard to claims 7 and 8, Ohkuma modified by Date and Chiu teach the composition of claim 1 (see paragraph 6 of the Office Action) but fail to disclose that the composition further comprises an oxetane compound and a polyalkylene ether compound.

Steinmann discloses a radiation-curable composition comprising:

- (A) at least one cationically polymerizing organic substance;
- (B) at least one free-radical polymerizing organic substance;
- (C) at least one cationic polymerization initiator;
- (D) at least one free-radical polymerization initiator (par.0023-0027).
- (E) at least one hydroxyl-functional compound (par.0028)
- (F) at least one hydroxyl-functional oxetane compound (par.0029).

The composition of Steinmann et al. gives exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (par.0002).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a at least one hydroxyl-functional compound, such as polypropylene glycols of various molecular weights, glycerine propoxylated polyether triol and polyethyleneglycols and at least one hydroxyl-functional oxetane compound , as disclosed by Steinmann, to the composition of Ohkuma modified by Date , in order to obtain a composition with exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (Steinmann, par.0002).

The hydroxyl-functional oxetane compound (F) of Steinmann et al. is equivalent to the oxetane compound of claim 7 of the instant application.

Steinmann et al. teach that the preferred compound (F) is 3-ethyl-3-hydroxymethyl-oxetane (par.0110)

In Example 1 (table 2, par.0151), Steinmann specifically discloses that 3-ethyl-3-hydroxymethyl-oxetane (Cyracure UVR 6000, in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 26.78 wt.% with respect to the 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

Steinmann discloses that the one hydroxyl-functional compound (E) (par.0023-par.0028) may be glycerine propoxylated polyether triol (par.0103).

The glycerine propoxylated polyether triol is equivalent to the polyalkylene ether compounds of claim 8 of the instant application.

In Example 1 (table 2, par.0151), Steinmann specifically discloses that glycerine propoxylated polyether triol (Voranol CP 450 in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 17.85 wt.% with respect to 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

Response to Arguments

8. Applicant's arguments, see pages 2-5 of the Remarks, filed on January 10, 2011, with respect to the rejection of claim 1 under 35 USC 103(a) over Ohkuma in view of Date have been fully considered and are persuasive.

The examiner agrees that the interpretation of the limitation "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" is not an intended use and apologizes for the error.

Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground of rejection is made in view of Ohkuma in view of Date.

The applicant argues that the limitation of claim 1 "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" describes the state or property of the component.

However, the examiner would like to show that this limitation indicates *the state/property of the photoinitiator for cationic polymerization before it is mixed to the other compounds to form the resin composition*. This is clearly shown in paragraph (2)

on page 29 (Example 1) and paragraph (2) on pages 31-32 (Example 2) of the specification of the instant application. These Examples clearly show that a photoinitiator for cationic polymerization is dissolved in a solvent.

In order to form the claimed composition, the solution/dispersion of photoinitiator for cationic polymerization is mixed with the other components. The resin composition comprises all the claimed components and the solvent which dissolved the photoinitiator for cationic polymerization (see paragraph (3) on page 29 (Example 1) and paragraph (3) on page 32 (Example 2) of the specification of the instant application).

In the resin composition, all the components are mixed and dissolved (see paragraph (3) on page 29 (Example 1) and paragraph (3) on page 32 (Example 2) of the specification of the instant application).

Therefore, the limitation "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" do not refer to the property/state of the photoinitiator for cationic polymerization in the resin composition but before the resin composition is made.

The end-product of the instant application (the resin composition of claim 1) is a composition comprising:

- a cationic-polymerizable organic compound comprising at least one compound having an epoxy group,
- a radical-polymerizable organic compound comprising at least one compound having a (meth)acryl group,

- a photo initiator for cationic polymerization which meets the limitations in claim 1,

- an ultraviolet light-sensitive photo initiator for radical polymerization and
- a solvent, as clearly shown in paragraph (3) on page 29 (Example 1) and in paragraph (3) on page 32 (Example 2) of the specification of the instant application.

Okhuma modified by Date teach a composition comprising:

- a cationic-polymerizable compound comprising at least one compound having at least one epoxy group (see columns 5-7 of Okhuma et al.);

- radical-polymerizable organic compound comprising at least one compound having a (meth)acryl group (see column 3, lines 17-35 of Okhuma et al.);

- photoinitiator for cationic polymerization of formula (I) (see column 10, lines 5-10 and 23-24 of Okhuma et al. and par.0063-0065 of Date et al), and

- an ultraviolet light-sensitive photoinitiator for radical polymerization (see column 8, lines 25-60 of Okhuma et al.).

Okhuma et al. also teach that the composition comprises a solvent which dissolves or disperse the components of the composition (column 11, lines 7-8).

Therefore, the composition of Okhuma modified by Date is equivalent to the resin composition of claim 1 of the instant application.

There are no structural differences between the resin composition of claim 1 and the composition of Okhuma modified by Date. The fact that the resin was obtained with "a photoinitiator for cationic polymerization which is the only component in the

composition dissolved or dispersed in a solvent" does not change the characteristics of the resin.

On page 4 of the Remarks, the applicant argues that the presence of a solvent in a composition for stereolithography has a dramatic effect on the procedure. However, the applicant does not show any evidence in support of these arguments.

Rebuttal evidence may also include evidence that the claimed invention yields unexpectedly improved properties or properties not present in the prior art. Rebuttal evidence may consist of a showing that the claimed compound possesses unexpected properties. *Dillon*, 919 F.2d at 692-93, 16 USPQ2d at 1901. A showing of unexpected results must be based on evidence, not argument or speculation. *In re Mayne*, 104 F.3d 1339, 1343-44, 41 USPQ2d 1451, 1455-56 (Fed. Cir. 1997) (conclusory statements that claimed compound possesses unusually low immune response or unexpected biological activity that is unsupported by comparative data held insufficient to overcome prima facie case of obviousness). (MPEP 2145 [R-6] Consideration of Applicant's Rebuttal Arguments)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anca Eoff/

Examiner, Art Unit 1722